



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,005	03/30/2004	Eric Stremler	T-6309	6057
34014 7590 12/27/2007 CHEVRON CORPORATION P.O. BOX 6006 SAN RAMON, CA 94583-0806			EXAMINER PATEL, SHAMBHAVI K	
			ART UNIT 2128	PAPER NUMBER
			MAIL DATE 12/27/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/814,005	Applicant(s) STREMLER ET AL.	
	Examiner Shambhavi Patel	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. The petition to revive the instant application has been granted. This Office Action is in response to the arguments submitted 02 August 2007.
2. Claims 1-30 have been presented for examination.

**Response to Arguments**

3. The 35 U.S.C. 112 and 101 rejections are withdrawn.
4. Applicant's arguments regarding the prior art rejection have been fully considered but they are not persuasive.

**Regarding claims 1, 2, 16 and 17:**

- i. **Applicant submits**, on page 9 of the remarks, that "In contrast to the teaches of Chen which give a predictor of passing for only predicting deposits in engine and oil consumption in the engine," the instant application recites "a plurality of simulated qualification tests" and "to determine a probability of passing indicator...of the proposed test sequence." **Examiner notes** that the claim does not recite any limiting definition on the term "qualification test." It merely recites that a plurality of qualification tests must be present. While the instant claim does not limit the tests to the engine, it does not specify components that the qualification tests must include. As per the Applicant's own admission, Chen teaches a plurality of qualification tests, such as:
  - a. predicting deposits in engine
  - b. predicting oil consumption in engine
- ii. **Applicant submits**, on page 9 of the remarks, "[i]n contrast to the teaching of Chen requiring laboratory testing and then making a customized model using those test results (kinetic constants) and specific to an engine, the instant claims do not restrict the computer simulation of an engine test to the results of laboratory tests." **Examiner notes**

that it is unclear what the Applicant is arguing. The claims do not in any way limit how the model is built (in fact, the claims do not even require a model). The meaning of the statement "...do not restrict the computer simulation of an engine test to the results of laboratory test" is unclear. Chen does not directly simulate the laboratory tests to determine the passing probabilities; rather, he uses these tests to develop the parameters for the model (section 7), which is then simulated to determining the passing probabilities (abstract and conclusion). The tests disclosed by Chen (predicting deposits in the engine and predicting oil consumption in the engine) are analogous to the qualification tests in the instant claim, and the prior art further discloses predicting the possibility of passing each test. The rejection is maintained.

**Regarding remaining claims:**

- iii. **Applicant submits** general allegations that no motivation exists for combining the references cited in the previous Office Action. **Examiner notes** that motivation statements were provided for all combinations, and requests the Applicant specifically disclose why the combinations are improper.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claim(s) 1, 2, 4, 8, 11-18, 19, 23, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen ('A Chemical Kinetics Model to Predict Lubricant Performance in a Diesel Engine. Part I: Simulation Methodology') in view of Greenhouse Gas Technology Center ('Test and Quality Assurance Plan ConocoPhillips Fuel-Efficient High-Performance SAE 75W90 Rear Axle Gear Lubricant'), herein referred to as 'Greenhouse'.**

**Regarding claims 1, 2, 16, and 17:**

**Chen discloses** a method of simulating and optimizing qualification testing of lubricating oil products, the method comprising passing a plurality of lubricating oil product characteristics to a simulator engine (**abstract**), wherein the simulator engine comprises a plurality of simulated qualification tests and processing the lubricating oil product characteristics in one or more of the simulated qualification tests (**abstract; 'Introduction' paragraphs 4-5**), wherein the output of each simulated qualification test includes a probability of passing indicator for indicating the probability that a lubricating oil product have the inputted characteristics would pass an actual qualification test (**abstract; 'Introduction' paragraphs 4-5; 'Conclusion'**)

**Chen does not explicitly disclose** using a strategy simulator engine to optimize the qualification tests according to cost and time. **Greenhouse teaches** doing testing on actual lubrication oils by taking in

parameters (**Greenhouse: page 1-3**), choosing a cost effective test (**Greenhouse: page 1-5**), and tracks the time and cost required to complete the test (**Greenhouse: pages 1-5 and 4-2**). At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Greenhouse because in order to accurately simulate the lubrication oil model, real life parameters and data must be acquired.

**Regarding claims 8 and 23:**

**Chen and Greenhouse disclose** to the method of claim 1, wherein the lubricating oil product characteristics comprise base oil percentage and characteristics, viscosity index improver percentage and characteristics, additives percentage and characteristics, and pour point depressants percentage and characteristics (**Chen: 'Calculation Procedure'**).

**Regarding claims 4 and 19:**

**Chen does not explicitly disclose** tracking test time and cost. **Greenhouse teaches** doing testing on actual lubrication oils by taking in parameters (**Greenhouse: page 1-3**), choosing a cost effective test (**Greenhouse: page 1-5**), and tracks the time and cost required to complete the test (**Greenhouse: pages 1-5 and 4-2**). At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Greenhouse because in order to accurately simulate the lubrication oil model, real life parameters and data must be acquired

**Regarding claims 11, 12, 26, and 27:**

It would be obvious to a skilled artisan to include the functionalities of these claims because in order to follow the industry standards, the simulator should accommodate the 'Codes of Practice'.

**Regarding claims 13 and 28:**

**Chen discloses** running the simulation using two different experimental lubricants and three different reference oils (**abstract**).

**Regarding claims 14-15 and 29-30:**

It would be obvious to a skilled artisan to enter the Codes of Practice into the simulator so that the model and tests may conform to industry standards. It is further obvious that these standards have to be translated into a machine-recognizable language (otherwise they could not be factored into the simulation).

6. **Claim(s) 5-7 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen ('A Chemical Kinetics Model to Predict Lubricant Performance in a Diesel Engine. Part I: Simulation Methodology') in view of Greenhouse Gas Technology Center ('Test and Quality Assurance Plan ConocoPhillips Fuel-Efficient High-Performance SAE 75W90 Rear Axle Gear Lubricant'), herein referred to as 'Greenhouse', in further view of Lampinen ('Bayesian Approach for Neural Networks – Review and Case Studies').**

**Regarding claims 5-7 and 20-22:**

**Chen and Greenhouse do not explicitly disclose** using modeling techniques selected from neural networks, Bayesian network, and mixtures thereof. **Lampinen teaches** applying neural networks, Bayesian networks, and a random factor to modeling. At the time of the invention, it would have been obvious to combine the teachings of Chen, Greenhouse, and Lampinen because these applications eliminates the need to guess attributes that are unknown in the model (**Lampinen: abstract**)

7. **Claim(s) 3, 5, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen ('A Chemical Kinetics Model to Predict Lubricant Performance in a Diesel Engine. Part I: Simulation Methodology') in view of Greenhouse Gas Technology Center ('Test and Quality Assurance Plan ConocoPhillips Fuel-Efficient High-Performance SAE 75W90 Rear Axle Gear Lubricant'), herein referred to as 'Greenhouse', in further view of Buseti ('Genetic Algorithms Overview').**

**Regarding claims 3, 5, 18, and 20:**

**Chen and Greenhouse do not explicitly disclose** the use of genetic algorithms, simulated annealing, or a random factor when trying to optimize the qualification tests. **Buseti teaches** using genetic algorithms (which encompasses simulated annealing and a random factor) to solve optimization problems (**Buseti: 'Introduction and Background'; 'Overview'; 'Comparison with other Methods'**). At the time of the invention, it would have been obvious to combine the teachings of Chen, Greenhouse, and Buseti because genetic algorithms, simulated annealing, and random factors are robust techniques that have been shown to outperform conventional optimization techniques on difficult, discontinuous functions (**Buseti: 'Suitability'**).

8. **Claim(s) 9-10, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen ('A Chemical Kinetics Model to Predict Lubricant Performance in a Diesel Engine. Part I: Simulation Methodology') in view of Greenhouse Gas Technology Center ('Test and Quality Assurance Plan ConocoPhillips Fuel-Efficient High-Performance SAE 75W90 Rear Axle Gear Lubricant'), herein referred to as 'Greenhouse', in further view of Faller ('Multicanonical Parallel Tempering')**



**Regarding claims 9-10 and 24-25:**

**Chen and Greenhouse do not explicitly disclose** the use of parallel Monte Carlo simulation.

**Faller teaches** the use of the parallel Monte Carlo method when doing fluid simulation (**Faller: abstract**). At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine teachings of Chen, Greenhouse, and Faller because the use of advanced Monte Carlo techniques can considerably facilitate the study of complex systems by improving sampling (**Faller: abstract**).

**Conclusion**

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

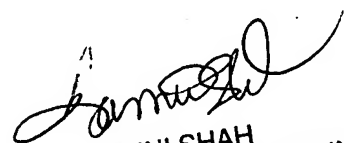
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

  
KAMINI SHAH  
SUPERVISORY PATENT EXAMINER